XV. *On species of* Chrysopa *observed in the Eastern Pyrenees; together with descriptions of, and notes on, new or little-known Palæarctic forms of the genus.* By Robert McLachlan, F.R.S., &c., Treas. Ent. Soc.

[Read April 12th, 1893.]

In the month of July, 1886, I had the privilege of being the guest of our esteemed colleague Mons. René Oberthür at his villa at Vernet-les-Bains (Dép. des Pyrénées Orientales). This small town, noted for its thermal springs, is admirably situated for the requirements of an entomologist; the district is sufficiently near the sea to have a Mediterranean element in its fauna, sufficiently elevated to have its summer heat tempered, and close enough to the Spanish frontier to have a real mixture of Peninsular forms not found elsewhere in France. My captures of Neuroptera in nearly all families were considerable, but in no respect were they proportionally richer than in the genus *Chrysopa*, species of which abounded near the town, and more especially in terraced abandoned vineyards, where, as is usual elsewhere, I found the Ash trees (*Fraxinus excelsior*) harboured the larger number. During my short stay of more than a week over 150 examples were captured; these were roughly examined soon after my return,* but until now they had remained, without more critical notice, in a store-box. A more careful scrutiny reveals at least ten species, some being of considerable interest; and as practically nothing whatever has been written on these insects so far as regards that particular part of Europe, I propose to give a list of the species observed with comments, as a small contribution towards a knowledge of the local fauna.

I have alluded to Ash as the most productive tree for

* Exhibited at the meeting held on Sept. 1st, 1886, see Proc. Ent. Soc., 1886, pp. xlii—xliii; the provisional list of species there given has been slightly modified and augmented.

many species of *Chrysopa;* such is my experience. Next to Ash comes Lime (*Tilia*). The inference is that such trees furnish the Aphides, or Coccids, on which the larvæ feed; but many species frequent any kind of deciduous tree indiscriminately, varying only in degree of abundance. A few affect conifers (and especially *Abies excelsa*) almost exclusively, their prey evidently being attached to the same trees. And I am convinced that a small number (e. g., *C. phyllochroma*) are probably attached to herbaceous plants. These remarks of course apply to European forms. The foregoing notes on habits are incidental only, and not specially connected with the Eastern Pyrenees.

The few descriptions of new or little-known forms, here given, partly concern the species of the Eastern Pyrenees, and are partly the outcome of a general review of my Palæarctic collection. To the small band of entomologists who have attended critically to this genus it is needless to state that if the difficulties connected with the determination of isolated specimens be great, they often increase in direct proportion to the number of specimens.

List of Species captured at Vernet-les-Bains, and Vicinity (Pyrénées Orientales).

Chrysopa perla, L.—Tolerably common.

C. Walkeri (Brauer), McLach., n. sp., see p. 229.—Very common.

C. septempunctata, Wesm.—About ten examples exhibiting no variation.

C. aspersa, Wesm.—Very abundant, and very variable, as elsewhere. There can be little doubt that this should take the name of *prasina*, Burm., but as there is just a shade of suspicion that more than one species is included in the varying forms of "*aspersa*," I think it better to leave the matter as given in my article in Ent. Month. Mag., xxiii., pp. 33—36.

C. Picteti, McLach. (=*thoracica*, Ed. Pict., nom. præocc., *cf.* Ent. Month. Mag., xvii., p. 63).—One somewhat doubtful example.

C. lineolata, McLach. (=*clathrata*, Ed. Pict., nec Schnd.), see p. 232.—Eight examples.

C. flavifrons, Brauer.—Most abundant and very vari-

able. As stated elsewhere, I think it probable that several of Ed. Pictet's species will eventually be merged into *flavifrons* as varieties.

C. viridana, Schnd. — Very abundant. A most charming species when alive, the bright green being set off by the striking yellow or whitish dorsal line. Like most others it soon fades.

[*C. tenella*, Schnd.—Two examples occurred at Cauterets (Hautes Pyrénées), but the species was not observed at Vernet.]

C. flava, Scop.—Not uncommon.

C. vulgaris, Schnd.—Tolerably common.

New or little-known Palæarctic Species.

Chrysopa Walkeri (Brauer, in Mus.), n. sp.

Of the size and form of *C. perla*, L., Schneid., but the general coloration is *full green* (not blue-green). Head with a slight yellowish tinge, strongly marked with shining black as follows:—a more or less triangular spot on each side of the posterior margin touching each eye, and sometimes connected by a narrow line on the posterior margin, or sometimes this line is broken up into spots (or it may be virtually obsolete); on the middle of the vertex near the posterior margin (and sometimes touching it) are two contiguous spots, often united, but varying much in size (and occasionally obsolete); extending from the middle of the vertex forwards is a ⅄-shaped mark, the branches of which are often thickened towards their tips (or origin), connected by a stalk between the base of the antennæ, and again, *on the front*, with two crescentic (◡◡) marks below the base of the antennal sockets, and there is frequently a fine line at the origin of the basal joint; on the front are two large round-oval spots on each side, one on the genæ, the other on either side of the clypeus. Palpi for the most part black, pale at the base and at the articulations. Antennæ pale brownish, the second joint wholly shining black. Pronotum hairy, its sides broadly black, which colour is more or less divided, by the transverse groove, into two spots on either side. Meso- and meta-notum with a large (but varying) crescentic black spot on either side, in which is usually a black pupil. On the pectus there is a large median black spot on the prosternum and mesosternum (between the legs), and the coxæ are more or less black. Legs green, the tarsi brownish. Abdomen green, largely varied with black (not describable from dry individuals). In the anterior wings the longitudinal nervures are green, but the transverse nervules

mostly black, those below the sector interrupted with pale or wholly pale in their lower half, and those between the two rows of gradate nervules wholly pale. In the posterior wings the neuration is for the most part pale, excepting the costal and gradate nervules, and those (in part) between the radius and sector.

In 1867 two examples from Mehadia in Hungary (*J. Mann*) were sent to me by Dr. Brauer under the name here retained, and this name has found its way into catalogues and lists; but the species is now described for the first time. At Vernet-les-Bains it was very common, and easy to recognise on the wing on account of its peculiar green, and in this respect easy to distinguish from *C. perla* (which occurred with it, but more sparingly), the latter being very conspicuous on the wing by its blue-green "shimmer."

The two species (*Walkeri* and *perla*) are no doubt closely allied, but very distinct; the black markings on the head, &c., are less pronounced in *Walkeri*, and in it the ⅄ is always open posteriorly, whereas in *perla* it is closed. In this respect *Walkeri* somewhat resembles the North American *upsilon*, A. Fitch, which is a smaller species, and there is analogy with the European *dorsalis*, Burm.

Chrysopa intima, n. sp.

Closely allied to *C. Walkeri*. Differs principally as follows:—

The spots on the top of the head touching each eye are never connected by a line along the posterior margin of the head; the two spots on the middle of the vertex near the posterior margin are neither connected nor contiguous, but always distant, so that the distance between them is not much less than that between each of them and the spot touching the eye; the two branches of the ⅄ are rather more divergent. The palpi are paler. On the pronotum, instead of the broad black margins, are three black spots on either side (the lowest sometimes indistinct on account of retraction), and the markings on the meso- and meta-nota resolve themselves into distinct spots. The pectus and pleuræ *entirely without markings*, save a spot in the centre of the prosternum.

Siberia and Amurland; Irkoutsk (*Jakowlef*), Pokrofska (*Gräser*). Japan (*Lewis*, *Pryer*).

Formerly I used to consider the Asiatic examples above noticed were *C. Walkeri*, but it seems to me that the characters here given indicate a species, or at any rate

a very striking local form. The examples from Japan do not seem to differ from those from the mainland. I have not seen the true *C. Walkeri* from Asia, but *C. perla* occurs both in Siberia and Japan.

Chrysopa nana, n. sp.

Head and thorax whitish (or yellowish) grey above, with a very broad black marginal band on either side extending the whole length of the thorax (and probably of the abdomen also), sometimes with a short median fine black line on the anterior portion of the pronotum; face with a black line on either side extending along the genæ and clypeus; palpi lined with black externally; antennæ yellowish grey, sometimes with a blackish line on the basal joint externally; pleuræ and pectus varied with grey and blackish. Legs yellowish grey, with short fine black hairs; a black ring at the insertion of the coxæ, and another immediately before the apex of the femora (more extended on the posterior); tibiæ visibly compressed and somewhat dilated, with a blackish spot on the anterior and intermediate slightly before the middle externally; tarsi slightly testaceous; claws minute, simple. Wings long-oval, narrow, subobtuse; neuration with sparse black hairs; in the anterior pair the neuration is yellowish (or whitish), costal nervules 17—18, black, pale in the centre, the black portion dilated into a line at the confluence with the subcosta, and a similar dilatation (with clouding of the membrane) takes place at the axillæ of all the connections of the nervules with the nervures, giving the wing a peculiarly irrorated appearance, and there is a large and distinct oblong black spot on the third nervule in the space between the lower cubitus and the post-costa; neuration open, most of the cellules large and hexagonal; upper portion of third cubital cellule oval, the dividing veinlet extending beyond the superposed nervule; pterostigma obsolete, the pterostigmatic space without nervules; three nervules in both gradate series, the outer series close to the margin; in the posterior wing the black irrorations are less evident. Expanse of wings, $16\frac{1}{2}$—$18\frac{1}{2}$ mm.

Asia Minor (Adana) and Persia (Shahrud). Four examples in my collection. [Also Algeria, see Postscript.]

This striking little species is amongst the smallest known in the genus, and is remarkable for the black irroration of the otherwise transparent wings. Its affinities are probably with *C. Genei*, which is sometimes nearly as small, but has broader wings. In the

latter, and in some other species, there is a tendency to the flattened and dilated tibiæ above alluded to. In the example from Shahrud the basal joint of the antennæ appears to be blackish beneath.

[Postscript. Since this paper was read, I received from my friend the Rev. A. E. Eaton twelve examples of *C. nana*, taken by him on June 3rd, 1893, at Biskra, Algeria, sitting on oil-lamps in the Jardin opposite the station from 8 to 10 p.m. In this long series the black irrorations on the wings are still more strongly marked (no doubt due, to some extent, to the specimens being comparatively fresh). The expanse of wings varies from $14\frac{1}{2}$ to 19 mm. In the anterior wings there are more frequently 2 than 3 gradate nervules in the inner series (sometimes only one), but nearly always 3 in the outer (occasionally only 2). Mr. Eaton remarks that "its eyes were a sort of metallic blue-black, not coppery like those of other species."]

Chrysopa lineolata, McLach., Ent. Month. Mag., xvii., p. 64 (= *C. clathrata*, Ed. Pict., nec Schneider).

I have before me eight examples from Vernet-les-Bains, and one of Ed. Pictet's types of "*clathrata*" from Granada. That author also records it from Eaux Bonnes in the Pyrenees. As his diagnosis is simply translated from that of Schneider, and as my own remarks (*loc. cit.*) are scarcely sufficient, I give a more detailed description:—

Yellowish green, the head (including face) distinctly more yellow. On the vertex is a large obtusely triangular concave space, the raised margins of which are often (not always) tinged with ferruginous (or reddish brown); no spot between the antennæ; face frequently (not always) with a bilunate reddish brown transverse line placed considerably below the insertion of the antennæ, and there is a small spot (usually darker, almost blackish) on the genæ; palpi pale, slightly marked with brownish externally. Antennæ pale, frequently with a reddish line on the basal joint externally. Pronotum narrowed in front: in strongly marked specimens there is a sublateral ferruginous band on either side, not touching the lateral margins, which is continued on the mesonotum, and often on the metanotum likewise (but these sublateral bands are very variable, and in some examples the only indication

of them on the pronotum is an angulated mark on either side). Legs pale; tarsi testaceous; claws dilated at base. Abdomen pale, with short whitish pubescence. Wings: anterior pair with a minute blackish spot at the base of the costal margin; neuration pale, the nervules with a black point or space at either end, the gradate nervules (5—6 inner, 6—7 outer) wholly black; all the neuration bearing rather long and distinct blackish hairs: in the posterior wings most of the neuration below the sector in the lower half (excepting the gradate nervules) is wholly pale. Expanse, 24—31 mm.

The relationship of this species with *C. flavifrons*, Brauer, is evident, and it may be scarcely more than a condition of that somewhat Protean insect; those individuals, in which the reddish markings on the pronotum are reduced to an angulated indication, especially recall *flavifrons*. It is advisable that a re-examination be made of the single type of *C. granadensis*, Ed. Pict.

Two papers dealing with the results of examinations of Ed. Pictet's Spanish *Chrysopæ* have been published; the first by Hagen in the Stett. Ent. Zeitung for 1866, and the second by myself in the Ent. Month. Mag., vol. xvii., 1880. The conclusions arrived at were not quite the same, and I think we both erred on the side of insufficient knowledge of the range of variation in the species of this genus.

Chrysopa guadarramensis, Ed. Pict., Névrop. d'Esp., 65, pl. vi., figs. 1—4.

I have arrived at the conclusion that this species, originally described from one female, is quite distinct from *C. flava*, Scop., with which I had provisionally united it as a slight variety, and that three examples (one male, two females), taken by the Rev. A. E. Eaton in the Appenino Pistojese, Central Italy, are identical therewith, the most striking feature being that the two series of gradate nervules are entirely and conspicuously black; tolerably well indicated in Ed. Pictet's figure. The costal margin of the anterior wings is precisely as in *C. flava* in both sexes, and the male has the same incrassated nervules in the costal area. There is a very striking difference in the anal parts of the male, and in connection with these I have become aware of a serious error in a short article by me on the differences

of *C. flava* and *C. vittata*, published in the Ent. Month. Mag., vol. xx., pp. 161—163. I there alluded to the examples from Central Italy, and my characters of the male appendages were drawn up from the male from that locality (and therefore presumably *guadarramensis*), and do not apply to the true male of *flava*, in which the appendages are much more like those of *vittata*, the chief difference being that the inferior appendage in *flava* is obtuse, and carries a tuft of hair at the apex, whereas in *vittata* it is acute and very sharply upturned.*

This matter is of serious import, because it proves that two species differing in nothing but what is usually considered an unessential colour character (*flava* and *guadarramensis*), so far as general characters are concerned, yet differ remarkably in the structure of the appendages of the male.† It so happens that in the group to which *flava* and its allies belong (and which also includes *pallida*, Schnd.) is almost the only one in which the male appendages are prominent and easily discernible in dry individuals. Whether an examination of these parts in living or freshly-killed examples in species of other groups might throw light on the puzzling variations (so assumed) of some species, remains to be proved.

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* *C. guadarramensis* has no relationship to *C. 7-punctata*, with which *pallens*, Ramb., is identical. This is mentioned on account of the comparison drawn in Pictet's description.

† I have again alluded to the subject in the Ent. Month. Mag., 1893, pp. 108—109.